

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (Original) A piezoelectric pump drive circuit comprising:
a sine wave oscillation means for generating a sine wave signal of the frequency that drives a piezoelectric element of a piezoelectric pump;
a voltage-boosting means for converting a low-voltage power supply to a high voltage; and
an amplification means driven by high voltage generated by said voltage-boosting means for amplifying the signal supplied as output from said sine wave oscillation means and for driving said piezoelectric element by a high-voltage sine wave;
wherein said amplification means is composed of: a D-class amplifier driven by a high voltage generated by said voltage-boosting means for subjecting the signal supplied as output from said sine wave oscillation means to pulse-width modulation to realize amplification; and a low-pass filter for demodulating the output signal of said D-class amplifier.

2. (Original) A piezoelectric pump drive circuit comprising:
a sine wave oscillation means for generating a sine wave signal of the frequency that drives a piezoelectric element of a piezoelectric pump;
a voltage-boosting means for converting a low-voltage power supply to a high voltage;
an amplification means driven by high voltage generated by said voltage-boosting means for

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amplifying the signal supplied as output from said sine wave oscillation means and for driving said piezoelectric element by a high-voltage sine wave; and
control means for implementing variable frequency control over three or more different frequencies at the time of activation of said sine wave oscillation means.

3. (Currently Amended) A piezoelectric pump drive circuit comprising:
a sine wave oscillation means for generating a sine wave signal of the frequency that drives a piezoelectric element of a piezoelectric pump;
a voltage-boosting means for converting a low-voltage power supply to a high voltage;
an amplification means composed of a D-class amplifier driven by high voltage generated by said voltage-boosting means for subjecting a ~~for amplifying the~~ signal supplied as output from said sine wave oscillation means to pulse-width modulation to realize amplification, and a low-pass filter for demodulating the output signal of said D-class amplifier; said amplification means being driven at high voltage generated by said voltage-boosting means and amplifying the signal supplied as output from said sine wave oscillation means for driving said piezoelectric element ~~and for driving said piezoelectric element by a high-voltage sine wave; and~~
a control means for implementing variable frequency control over three or more different frequencies ~~of the frequency~~ at the time of activation of said sine wave oscillation means;
~~wherein said amplification means is composed of: a D-class amplifier driven by a high voltage generated by said voltage-boosting means for subjecting the signal supplied as output from said sine wave oscillation means to pulse-width modulation to realize amplification; and a low pass filter for demodulating the output signal of said D-class amplifier.~~

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4. (Currently Amended) A piezoelectric pump drive circuit comprising:

a sine wave oscillation means for generating a sine wave signal of the frequency that drives a piezoelectric element of a piezoelectric pump;

a voltage-boosting means for converting a low-voltage power supply to a high voltage;

an amplification means composed of a D-class amplifier driven by high voltage generated by said voltage-boosting means for subjecting a ~~for amplifying the~~ signal supplied as output from said sine wave oscillation means to pulse-width modulation to realize amplification , and low-pass filter for demodulating the output signal of said D-class amplifier; said amplification means being driven at high voltage generated by said voltage-boosting means and amplifying the signal supplied as output from said sine wave oscillation means ~~and~~ for driving said piezoelectric element by a high-voltage sine wave;

a temperature sensing means for sensing temperature; and

a control means for adjusting the signal amplitude of said sine wave oscillation means in accordance with the sensed temperature of said temperature sensing means.

5. (Original) A piezoelectric pump drive circuit comprising:

a sine wave oscillation means for generating a sine wave signal of the frequency that drives a piezoelectric element of a piezoelectric pump;

a voltage-boosting means for converting a low-voltage power supply to a high voltage;

an amplification means driven by high voltage generated by said voltage-boosting means for amplifying the signal supplied as output from said sine wave oscillation means and for driving said piezoelectric element by a high-voltage sine wave;

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a temperature sensing means for sensing temperature; and

a control means for adjusting the signal amplitude of said sine wave oscillation means in accordance with the sensed temperature of said temperature sensing means;

wherein said amplification means is composed of: a D-class amplifier driven by a high voltage generated by said voltage-boosting means for subjecting the signal supplied as output from said sine wave oscillation means to pulse-width modulation to realize amplification; and a low-pass filter for demodulating the output signal of said D-class amplifier.

6. (Original) A piezoelectric pump drive circuit comprising:

a sine wave oscillation means for generating a sine wave signal of the frequency that drives a piezoelectric element of a piezoelectric pump;

a voltage-boosting means for converting a low-voltage power supply to a high voltage;

an amplification means driven by high voltage generated by said voltage-boosting means for amplifying the signal supplied as output from said sine wave oscillation means and for driving said piezoelectric element by a high-voltage sine wave;

a first control means for implementing variable frequency control at the time of activation of said sine wave oscillation means;

a temperature sensing means for sensing temperature; and

a second control means for adjusting the signal amplitude of said sine wave oscillation means in accordance with the sensed temperature of said temperature sensing means.

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7. (Original) A piezoelectric pump drive circuit comprising:

a sine wave oscillation means for generating a sine wave signal of the frequency that drives a piezoelectric element of a piezoelectric pump;

a voltage-boosting means for converting a low-voltage power supply to a high voltage;

an amplification means driven by high voltage generated by said voltage-boosting means for amplifying the signal supplied as output from said sine wave oscillation means and for driving said piezoelectric element by a high-voltage sine wave;

a first control means for implementing variable frequency control at the time of activation of said sine wave oscillation means;

a temperature sensing means for sensing temperature; and

a second control means for adjusting the signal amplitude of said sine wave oscillation means in accordance with the sensed temperature of said temperature sensing means;

wherein said amplification means is composed of: a D-class amplifier driven by a high voltage generated by said voltage-boosting means for subjecting the signal supplied as output from said sine wave oscillation means to pulse-width modulation to realize amplification; and a low-pass filter for demodulating the output signal of said D-class amplifier.

8. (Original) A cooling system comprising:

a piezoelectric pump drive circuit comprising:

a sine wave oscillation means for generating a sine wave signal of the frequency that drives a piezoelectric element of a piezoelectric pump;

a voltage-boosting means for converting a low-voltage power supply to a high voltage; and

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an amplification means driven by high voltage generated by said voltage-boosting means for amplifying the signal supplied as output from said sine wave oscillation means and for driving said piezoelectric element by a high-voltage sine wave;

wherein said amplification means is composed of: a D-class amplifier driven by a high voltage generated by said voltage-boosting means for subjecting the signal supplied as output from said sine wave oscillation means to pulse-width modulation to realize amplification; and a low-pass filter for demodulating the output signal of said D-class amplifier;

a heat sink that contacts a heat-generating body;

a radiator for radiating heat to the outside;

coolant circulation passages connected such that coolant circulates between said heat sink and said radiator; and

a piezoelectric pump that is driven by said piezoelectric pump drive circuit for circulating coolant in said coolant circulation passages.

9. (Original) A cooling system comprising:

a piezoelectric pump drive circuit comprising:

a sine wave oscillation means for generating a sine wave signal of the frequency that drives a piezoelectric element of a piezoelectric pump;

a voltage-boosting means for converting a low-voltage power supply to a high voltage;

an amplification means driven by high voltage generated by said voltage-boosting means for amplifying the signal supplied as output from said sine wave oscillation means and for driving said piezoelectric element by a high-voltage sine wave; and

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control means for implementing variable frequency control over three or more different frequencies at the time of activation of said sine wave oscillation means;

a heat sink that contacts a heat-generating body;

a radiator for radiating heat to the outside;

coolant circulation passages connected such that coolant circulates between said heat sink and said radiator;

a piezoelectric pump that is driven by said piezoelectric pump drive circuit for circulating coolant in said coolant circulation passages.

10. (Original) A cooling system comprising:

a piezoelectric pump drive circuit comprising:

a sine wave oscillation means for generating a sine wave signal of the frequency that drives a piezoelectric element of a piezoelectric pump;

a voltage-boosting means for converting a low-voltage power supply to a high voltage;

an amplification means driven by high voltage generated by said voltage-boosting means for amplifying the signal supplied as output from said sine wave oscillation means and for driving said piezoelectric element by a high-voltage sine wave; and

a control means for implementing variable frequency control at the time of activation of said sine wave oscillation means;

wherein said amplification means is composed of: a D-class amplifier driven by a high voltage generated by said voltage-boosting means for subjecting the signal supplied as output from said sine wave oscillation means to pulse-width modulation to realize amplification; and a low-pass

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filter for demodulating the output signal of said D-class amplifier;
a heat sink that contacts a heat-generating body;
a radiator for radiating heat to the outside;
coolant circulation passages connected such that coolant circulates between said heat sink and
said radiator; and
a piezoelectric pump that is driven by said piezoelectric pump drive circuit for circulating
coolant in said coolant circulation passages.

11. (Original) A cooling system comprising:

a piezoelectric pump drive circuit comprising:
a sine wave oscillation means for generating a sine wave signal of the frequency that drives a
piezoelectric element of a piezoelectric pump;
a voltage-boosting means for converting a low-voltage power supply to a high voltage;
an amplification means driven by high voltage generated by said voltage-boosting means for
amplifying the signal supplied as output from said sine wave oscillation means and for driving
said piezoelectric element by a high-voltage sine wave;
a temperature sensing means for sensing temperature; and
a control means for adjusting the signal amplitude of said sine wave oscillation means in
accordance with the sensed temperature of said temperature sensing means;
a heat sink that contacts a heat-generating body;
a radiator for radiating heat to the outside;
coolant circulation passages connected such that coolant circulates between said heat sink and

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said radiator; and

a piezoelectric pump that is driven by said piezoelectric pump drive circuit for circulating coolant in said coolant circulation passages.

12. (Original) A cooling system comprising:

a piezoelectric pump drive circuit comprising:

a sine wave oscillation means for generating a sine wave signal of the frequency that drives a piezoelectric element of a piezoelectric pump;

a voltage-boosting means for converting a low-voltage power supply to a high voltage;

an amplification means driven by high voltage generated by said voltage-boosting means for amplifying the signal supplied as output from said sine wave oscillation means and for driving said piezoelectric element by a high-voltage sine wave;

a temperature sensing means for sensing temperature; and

a control means for adjusting the signal amplitude of said sine wave oscillation means in accordance with the sensed temperature of said temperature sensing means;

wherein said amplification means is composed of: a D-class amplifier driven by a high voltage generated by said voltage-boosting means for subjecting the signal supplied as output from said sine wave oscillation means to pulse-width modulation to realize amplification; and a low-pass filter for demodulating the output signal of said D-class amplifier;

a heat sink that contacts a heat-generating body;

a radiator for radiating heat to the outside;

coolant circulation passages connected such that coolant circulates between said heat sink and

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said radiator; and

a piezoelectric pump that is driven by said piezoelectric pump drive circuit for circulating coolant in said coolant circulation passages.

13. (Original) A cooling system comprising:
- a piezoelectric pump drive circuit comprising:
 - a sine wave oscillation means for generating a sine wave signal of the frequency that drives a piezoelectric element of a piezoelectric pump;
 - a voltage-boosting means for converting a low-voltage power supply to a high voltage;
 - an amplification means driven by high voltage generated by said voltage-boosting means for amplifying the signal supplied as output from said sine wave oscillation means and for driving said piezoelectric element by a high-voltage sine wave;
 - a first control means for implementing variable frequency control at the time of activation of said sine wave oscillation means;
 - a temperature sensing means for sensing temperature; and
 - a second control means for adjusting the signal amplitude of said sine wave oscillation means in accordance with the sensed temperature of said temperature sensing means;
 - a heat sink that contacts a heat-generating body;
 - a radiator for radiating heat to the outside;
 - coolant circulation passages connected such that coolant circulates between said heat sink and said radiator; and

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a piezoelectric pump that is driven by said piezoelectric pump drive circuit for circulating coolant in said coolant circulation passages.

14. (Original) A cooling system comprising:

a piezoelectric pump drive circuit comprising:

a sine wave oscillation means for generating a sine wave signal of the frequency that drives a piezoelectric element of a piezoelectric pump;

a voltage-boosting means for converting a low-voltage power supply to a high voltage;

an amplification means driven by high voltage generated by said voltage-boosting means for amplifying the signal supplied as output from said sine wave oscillation means and for driving said piezoelectric element by a high-voltage sine wave;

a first control means for implementing variable frequency control at the time of activation of said sine wave oscillation means;

a temperature sensing means for sensing temperature; and

a second control means for adjusting the signal amplitude of said sine wave oscillation means in accordance with the sensed temperature of said temperature sensing means;

wherein said amplification means is composed of: a D-class amplifier driven by a high voltage generated by said voltage-boosting means for subjecting the signal supplied as output from said sine wave oscillation means to pulse-width modulation to realize amplification; and a low-pass filter for demodulating the output signal of said D-class amplifier;

a heat sink that contacts a heat-generating body;

a radiator for radiating heat to the outside;

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coolant circulation passages connected such that coolant circulates between said heat sink and

said radiator; and

a piezoelectric pump that is driven by said piezoelectric pump drive circuit for circulating

coolant in said coolant circulation passages.